

# **SOUTHERN COASTAL SANTA BARBARA CREEKS BIOASSESSMENT PROGRAM**

## **2010 REPORT**

### **Prepared for:**

**City of Santa Barbara,  
Creeks Division**

**County of Santa Barbara,  
Project Clean Water**

### **Prepared By:**



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## **Executive Summary**

### **Introduction**

This report summarizes the results of the 2010 Southern Coastal Santa Barbara Creeks Bioassessment Program, an effort funded by the City of Santa Barbara and County of Santa Barbara. Ecology Consultants, Inc. (Ecology) prepared the report, and serves as the City and County's consultant for the Program. This is the 11<sup>th</sup> year of the Program, which began in 2000. The purpose of the Program is to assess and monitor the biological integrity of creeks in the study area as they respond through time to natural and human influences. The Program involves annual collection and analysis of benthic macroinvertebrate (BMI) samples and other pertinent physiochemical and biological data in study creek reaches using U.S. Environmental Protection Agency (USEPA) endorsed rapid bioassessment techniques. BMI samples are analyzed in the laboratory to determine BMI abundance, composition, and diversity. Scores and classifications of biotic integrity are determined for study streams using the Index of Biological Integrity (IBI) that was developed for the study area by Ecology. The IBI is a system that yields a numeric score and classifies the biological integrity of a stream as Very Poor, Poor, Fair, Good, or Excellent based on the BMI community present in the stream, as determined by completing a bioassessment survey and associated laboratory and analytical work. Seven "core BMI metrics" are calculated and used to determine the IBI score. Each core metric is highly sensitive to human disturbance, and collectively they represent different aspects of the BMI community including diversity, composition, and trophic group representation. By condensing complex biological data into an easily understood score and classification of biological integrity, the IBI serves as an effective tool for the City and County in monitoring the overall condition of local creeks, and taking appropriate watershed management actions.

### **Study Area**

The study area encompasses approximately 60 km of the southern Santa Barbara County coast from the Rincon Creek watershed at the Santa Barbara/Ventura County line west to Gaviota Creek. There are approximately 40 1<sup>st</sup> to 5<sup>th</sup> order coastal streams along this stretch of coast, all of which drain the southern face of the Santa Ynez Mountains. A total of 51 stream study reaches in 20 watersheds have been surveyed on one or more occasions during the springs and summers from 2000 to 2010. 25 stream study reaches were surveyed this year.

### **Methods**

Physiochemical and biological data for the study reaches was gathered through a combination of methods including field surveys, laboratory analyses, spatial data analyses using geographic information system software, and review of United States Geological Survey (USGS) 7.5-minute quadrangle maps and recent aerial photographs. The seven IBI core metrics were calculated for each study reach, and IBI scores and classifications of biological integrity were determined.

### **Results**

Overall, IBI scores at the study creeks were similar in range compared to the past four years (2006-2009). However, three recent wildfires (Gap, Tea, and Jesusita) coupled with scouring storm flows the following winters presumably caused noticeable losses in IBI scores at several of the affected study reaches in 2009 and 2010. This was particularly the case at study reaches M3 and M4 in the upper Mission Creek watershed following the Jesusita fire, which burned over

70 percent of the upper Mission Creek watershed. IBI scores at M3 and M4 were in the Good range in May 2009 just days before the fire, and were sharply lower (46 points lower at M4, 32 points lower at M3) and in the Poor range this past spring. The drops in IBI score at these study reaches are attributable to lower insect and EPT family diversity and lower percentage of sensitive BMI taxa and shredders and predators compared to before the fire. It will be interesting to track the recovery of these streams from the impacts of the fires over time.